Collaborative Energy and Water Cycle Information Services (CEWIS) Prototype

Steve Kempler

Jim Acker, Thomas Hearty, Bill Teng,
Guang-Dih Lei, Zhong Liu, Dana Ostrenga,
Anthony Ritrivi, Hualan Rui, Richard Strub

June 15, 2010

CEWIS Prototype Goal

- To demonstrate remote data search and access using NEWS Program datasets
- To exemplify services that can be provided to facilitate multi-dataset research
- To whet your appetite: To think about your own needs that would facilitate multi-dataset research

Multi-Dataset Data Preparation

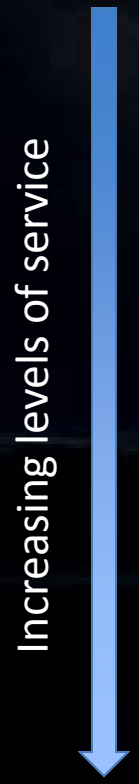
Scenario: a research scientist, requiring data sets from various sources, would typically perform the following operations before analyses can start:

- Access data sets from remote sites.
- Develop read programs for each data set.
- Harmonize data sets regarding formats, structures, projections, and spatial and temporal resolutions.
- Subset data sets (temporally, spatially, by parameter).
- Co-register data sets.
- (Dynamically) access/visualize co-registered multi-sensor data.

CEWIS Should Take Advantage of Existing Community Information Services

- Provide high-end information services focused on heterogeneous data sets, leveraging existing data and services.
- Provide access to many data sets available with various levels of services.
- Provide opportunity for broader access to hydrologic data products and services.

Provide High-End Information Services Focused on Heterogeneous Data Sets



1. Catalogue of local and/or remote data sets
2. Links to local/remote data sets
3. Software to read and manipulate data
4. Tools to search for and access data
5. Interactive data exploration and visualization services
6. Interactive data management services
7. Interactive multi-sensor data services
8. Data access, management, and multi-sensor data analysis tools for data sets locally and remotely archived
9. Web Services (e.g., OGC WMS, WCS) to acquire and serve distributed data sets

5 to 9 represent high end services

Provide Opportunity for Broader Access to Hydrologic Data

For selected providers, services provided (from previous slide) are shown

Selected Data and Service Providers	1	2	3	4	5	6	7	8	9
NDIC	•	•	•	•					
CREW				•	• a				
ISCCP	•	•	•	•		• a	• a		
GPCP	•	•	•	•	• a		• a	•	
BALTEX		•		•					
GPCC	•	•		•	• a				
SRB	•	•	•	•	• a				
LBA	•	•		•	• a				
CEOP	•	•	• b	• b	• b			• b	
CRDC					•	•	•		
CUAHSI-HIS			•	• c	• c	• c			• c
WCI2	•	•	•	•	•	•	•	•	•

a – Not interactive
b – Some projects
c – Data not locally archived

Provide Opportunity for Broader Access to Hydrologic Data Products and Services

Energy and Water Cycle Data

TRMM Tropical Rainfall Measuring Mission

more

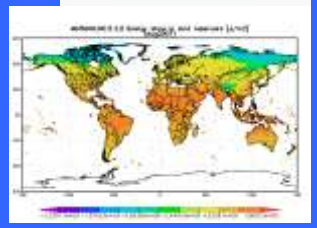
Data Access Protocols

OpenDAP
WMS WCS
ftp

Data services

CEWIS

Interactive data search, exploration and visualization tools, data reduction, format conversion, multi-sensor data co-registration, correlation, and analysis tools



Integrated Data Services

Data Search Request

New Products

Data

Multi-Data Set Request

Data

Researchers

Community Interactions (thus far)

Positive feedback and recommendations have been received at the following venues:

- Precipitation Measurement Missions Science Team Meeting
- NEWS Science Team Meeting
- AGU Fall'09 oral presentation entitled, "Collaborative Energy and Water Cycle Information Services (CEWIS): The Prototype"

Demonstration Purpose

- To show possible data services for NEWS data sets.
- To provide some starting points of discussion on NEWS multi-dataset analysis requirements.

Caveats:

This is a working prototype, not meant to be used as is

It includes a limited set of data products and services

It has placeholders for growth

It is not operational

Demo Components

- CEWIS Portal
- Data search and access (Mirador)
  - "Manual" option
  - OpenSearch options
    -- Have own search engine
    -- Publish to ECHO
    -- Install provided search engine
- Data visualization and analysis (Giovanni)
  - 3 instances (monthly, daily, 3-hourly)


DEMO

Thanks to our Demo Collaborators

- Fetzer - Merged Atmospheric Water Data Set from the A-Train
- Rossow – ISCCP
- Joyce – CMORPH
- Huffman – GPCP2
- Rodell – GLDAS

Looking Ahead – Short Term

Based on community feedback…

- Initially focus on hydrological data sets archived at the GSFC Earth Sciences Data and Information Services Center (GES DISC) and NASA Energy and Water Cycle Study (NEWS).
- Establish data server/client protocols with data providers to facilitate usage of remote data sets without data duplication.
- Expand with additional NEWS data sets, as well as GEWEX experiment data sets.
- Keep growing with useful community data and services.
- Formulate a Community Advisory Committee.
- Initiate community workshops: To seek community consensus on desirable tools and CEWIS direction.

Looking Ahead - Long-Term Plans

Based on community feedback …

- Specify a 3-year plan in the CEWIS Project Plan.
- Implement CEWIS's evolving remote data access web services, existing data management services, and user-provided research scenarios.
- Establish a series of mutually beneficial data and service exchanges with pertinent projects (e.g., GEWEX, NEWS, CEOP).
- Develop annual implementations in direct response to the latest community needs.
- Establish long-term service enhancement collaborations with hydrology/energy cycle research/data organizations (e.g., had productive discussion with CUAHSI at AGU Fall'09).
- Benchmark and report metrics to assess CEWIS impacts on facilitating science.

Keys to Success of CEWIS

- Respond to required services specified by community feedback and science needs.
- Leverage and build upon existing systems that offer energy and water cycle data access and services.


Thank you